

Lori Garver Speech
Women In Aerospace Breakfast
March 4, 2010

It's my pleasure to be here today. This organization has been important to me throughout my career. It's been a major resource and support group (something that has come in handy at different points in my career), and I have met many people through WIA who have become lifelong friends and colleagues. WIA held my baby shower for Wes (Pam Mountjoy) and when he was 8 days old, Wes attended his first WIA event at the National Air and Space Museum (he received at least one marriage proposal that night – don't tell Paula Korn he turns 18 on Tuesday (where he will again be attending a space event with his mother and father...))

It is partly because of WIA that I am not the only woman in meetings at NASA as much as a person in my position would have been 25 years ago when WIA was founded (of course there wouldn't have been a woman in my position 25 years ago).

I hope that 25 years from now – when Katie Grace is (hopefully) working in the aerospace field there will be an equal number of women and men in her meetings.

I believe that the budget for NASA, proposed by President Obama for 2011 will help us reach not only that goal of having many more women working in our field, but will help us reach many other goals as well. Allow me to explain.

Over the last few weeks, you have heard us describe this budget proposal as “bold and ambitious”, a transformative roadmap for NASA in the 21st century. with an increase of \$6 billion dollars for NASA over 5 years This budget makes NASA home once again to big ideas, keeps us at the forefront of technical innovation and a world leader in spaceflight and science and returns increased value to the American tax payer.

But what do we mean?

Let me try to explain....President Obama believes that NASA is key part of America's future and that NASA contributes greatly to critical national priorities... So what are those priorities?

- Economic development (poverty, hunger, jobs)
- International leadership/geo-politics (world peace)
- Education (societal advancement)
- Environment (future of planet and humanity)

These are things a broader segment of the population—yes—more women—care about.

Aligning how NASA spends \$100B of American's tax dollars over the next 5 years and beyond is not taken lightly by the President, or any of us. When you take the oath to serve the public – especially if you are a student of political science like I am – you can't help but think about it every day.

But those decisions are what we entrust to our elected political leadership and the President did the difficult thing with his proposed 2011 budget – and is taking on the status quo to do it.

So why did President Obama choose this path, instead of doing the easy, politically expedient thing and simply extend existing programs – when many of the most visible negative results of that decision would not have been felt for a few years? Again, because he believes that NASA can and must do better. You all have heard the quote, "We do not do this because it is easy, but because it is hard." Well I say that we do this not because it is easy, but because it matters.

Right now we have the chance to lay the groundwork for the way that our kids and grandkids will experience space. A sustainable, affordable way for exploration to proceed. That creates jobs now and in the future. And that has all the excitement that the space program has delivered for generations.

We're talking about a whole new way of looking at exploration. Not just using the current technologies we have, as impressive as they may be, but taking a hard look at where we want to go and what we will really need to get there. Not just dreams, but reality.

I'm sure most of you will have had a chance to familiarize yourself a little with the budget proposal and some of its details. In the big picture, the fact that NASA is getting \$6 billion more over five years at a time when many agencies are shrinking or seeing flat budgets should be extremely gratifying.

In addition, the president has called for \$7.3 billion toward a technology development and demonstration program. Another \$3.1 billion will be for heavy lift propulsion systems and \$3 billion for robotic precursor missions. Our work will be driven toward capabilities we need for the destinations we have wanted to go to for decades, (the Moon, NEO's and Mars and its moons). with technologies on the cusp, where, with some additional resources, we could make rapid strides.

The International Space Station has been extended to 2020 or beyond , allowing us to use it fully as the national laboratory and platform for international cooperation that was envisioned at its inception. We will increase utilization of the Station's R&D capabilities to conduct scientific research, improve our capabilities for operating in space, and demonstrate new technologies, including those that will be critical to exploration.

Human research programs get a significant increase as well, allowing us to delve more deeply and widely into the questions that future explorers will have to answer to maintain their health in space, questions about human physiology, the heart, muscles and bones, which can benefit space explorers as well as those of us here on Earth.

Science gets tremendous support with an additional \$2B (over 5 years) for new Earth observation missions and climate modeling work, and to re-fly the Orbiting Carbon Observatory to make precise, global measurements of atmospheric carbon dioxide and better understand climate change. Our next four Earth Science decadal missions will be accelerated 2-3 years under this new plan. We'll also fly new missions throughout the planetary systems of our solar system and fly unprecedented missions to the sun that will contribute to our understanding not only of the science of the sun and its future, but of space weather (NOAA space weather center).

Green aeronautics gets a commitment for safer, cleaner and more environmentally friendly air transportation. NASA will focus on both innovative fundamental research in green aviation, and on systems-level applications to enhance fuel efficiency and reduce aircraft noise and emissions.

That is the general overview. What I want to talk to you about today is how we see this vision playing out for NASA and for the many people, a lot of them in this room, who have a stake both personally and professionally in NASA's success.

Let me start with the decision to cancel Constellation, because obviously that will have a huge impact on the agency and the many dedicated people who have been working on it for the past five years.

The program has had many successes, notably the Ares I-X test launch last year, which I was as thrilled as anyone to travel to attend, (then had to leave for WIA awards to present Linda Billings with the Goddard Trophy... priorities). We are forever grateful to the teams across the country that have given their hearts and souls to this program. We understand that stopping a program as big and complex as Constellation, that touched so many lives in so many states, is not something to be taken lightly, and it doesn't happen overnight we are working very carefully to understand how to best go forward with this plan, should Congress support the President's plan.

Let me be clear. NASA honors the work of the people who have been laboring to make Constellation a success – our civil service, as well as our contractors. Its proposed cancellation is in no way a reflection on their skill or professionalism or dedication. Quite the opposite. I believe this incredibly talented workforce deserves to work on programs that are properly structured, managed and funded to succeed.

The simple fact is that we inherited a system that no longer made sense to continue. Without increasing NASA's budget significantly (more than the \$3B in the Augustine report – which would not in fact have covered extending Constellation), we couldn't afford the Constellation systems and also do those critical activities supported by nearly everyone in this budget. Flying out the Shuttle safely, extending the life of the ISS and fully utilizing that \$100B research lab, increasing aeronautics and Earth Sciences, investing in technology development...

You can also think of it this way – for those of you focused on working to get Constellation back in the budget for 2011 (and I harbor no ill-will against those of you working to do that – I believe in this Democracy – I love our system of government, have studied it, and it is the reason I moved to Washington, DC the day I graduated from College – to work for Senator John Glenn who was running for President) – so I get it – it is our rights as citizens to work with our elected officials to make our views known.

So – if Constellation is put back in the budget – (without a \$3-5B increase in NASA's top-line) – that much money would have to be cut from the proposed budget – meaning no extension of the ISS (so when Ares/Orion launches for the first time in 2017 – there will be no where for it to go --- for about 10 years, until the Ares V is developed (since the funding for Ares V didn't begin in any serious way until 2016 – it needed the funding from driving the ISS into the Pacific...) No flying out the Shuttle safely – the \$600M budgeted in '11 would be needed for Constellation – so perhaps Shuttle would be retired without the last flight or two – no AMS? No OCO reflight, or climate and earth science missions would be flown for another 5 years, possibly leaving us with large data gaps about our planet's health and no investment in technology development that contribute to a growing economic base.

If Constellation is terminated, as proposed, we will build on its legacy, using what makes sense in the new plans.

Constellation taught us many things as an agency. It helped generate a synergy between science and exploration that is stronger now than ever before. It showed us

how exploration can fuel our scientific goals and reminded us how robotic missions and those with humans aboard can both share in a greater purpose.

The Lunar Reconnaissance Orbiter now circling the moon is a good example of this synergy. Begun as an exploration mission, it's given us an extraordinary view of a "new moon," one with many unexpected surprises. It continues to give us data that humans will use in a return to the moon and it's also got the scientists salivating over new findings that are literally rewriting textbooks about our supposedly quiet neighbor. LRO is an example of the type of precursor mission that we hope to have many more of in the future, and at many more places.

At its best, Constellation started NASA thinking again about reaching beyond the embrace of our planet and really exploring. If we are now able to dedicate enough resources to develop new technologies, we can make the leaps ahead that will enable this exploration to proceed in a more sustained and productive manner.

If NASA does not connect again with the American public (and in a democracy, as I mentioned – by extension our national leaders...) we will not continue to be able to explore space on behalf of the public. What we do must be seen as providing value and it is investment in technology and R&D that has provided for our economic growth for the past century.

In the final analysis, what we are looking at here is something transformative. Not only the technologies that will bring us closer to actually sending humans to Mars and other places, but a meaningful effort that allows us to continue without stops and starts. We're not Vikings, but we have Columbus who explored and stayed (when is Leif Erikson day?) A unified whole where science and technology partner more deeply. A broad plan that has us fanning out across the solar system in ways we never have before and at completely new destinations. Just last month, we had teams in Hawaii demonstrating technology for extracting oxygen from soil, a resource that could potentially be used for rocket fuel or in many other useful ways. We're already doing a lot of future-looking things, but we want and need to do more.

And even as we look toward the technologies of tomorrow, we're looking at a transformation of how we do business IN space, and how we support the business OF space. This budget begins a major new program to spark innovation in the commercial space field. As most of you here know, this is not a new idea. We do feel, however, that it is an idea whose time has come.

For years, the government has borne nearly all the costs of access to low Earth orbit (although we have hardly done it alone – it could not and would not have been done with the creativity and innovation of our industrial/commercial partners). And we've had a glorious experience in the process. But we believe those in industry are ready to take the next steps – and do for our most precious cargo, our astronauts, what they have been doing for other valuable cargo for decades. As we are able to lessen our grip on this activity, we will not only be seeding new LEO markets and developing a healthy industrial base and jobs as transportation costs decline, but it will allow us to focus on doing those longer-term, more risky missions that require our unique capabilities.

But beyond the human spaceflight plans that have been garnering the headlines, let me again call your attention to the great things for aeronautics, science and education in this budget.

Aeronautics is indeed the first A in NASA, and we're going to be enlarging our focus there. Again, we're talking about new technologies, and in aeronautics there will be very practical benefits. Planes that burn less fuel and make less noise and are safer. These are some of the things NASA can excel at based on our decades of experience developing cutting edge flying vehicles. The flying public deserves for NASA to get back in this arena and in addition, commercial aviation is a key contributor to economic advancement.

This is a renaissance time in Science. Earth science in particular gets a great deal of attention in this budget, enabling NASA to re-fly the Orbiting Carbon Observatory, a heartbreaking disappointment when it failed to make orbit last year, and a much needed satellite to tell us more about carbon emissions worldwide. We'll be making the decadal priorities of the field a priority, beginning work on the missions the scientists are telling us are most pressing to fill in the knowledge gaps over the next ten years. We'll be developing more accurate climate modeling technology and also predictive techniques that could help us spot natural disasters or climate extremes in the making.

Everyone's aware of the sun, but we want to know more about what is possibly the most fascinating body in our vicinity. We'll be supporting Solar Probe Plus, a spacecraft that will bring us closer to the sun than we have ever been before, and of course we'll be waiting with great anticipation for the first results from the Solar Dynamics Observatory that just launched two weeks ago.

We'll also enhance a project to identify and catalog near Earth objects. It seems every year or so there's a big jolt in our consciousness as one of these neighbors of ours

makes a close pass by the Earth. With a comprehensive atlas of them, we should be much more confident in our predictions of their activities and any threat they pose.

And like Charlie said last month, the key to all of this is that we create a new generation of explorers, people who want to fly to space, or to develop the technology to make it possible, or who just want to study our cosmos, or even a better education citizenry which is key to a successful democracy. So education is another focus. NASA has many programs to interest young people, one of the most highly trafficked sites on the Web, and some of the most active and responsive social networking sites of any government agency, really of anyone in aerospace. The President wants to tap into this potential in a big way, starting with a Summer of Innovation this year to link efforts across the country and get kids looking to NASA and to each other as they explore questions about our solar system and the universe.

So to sum up, we're looking at a new playing field, with new jobs and new opportunities. We expect there to be much more diversity in the ways people think about NASA and the way we can pursue aerospace careers in the future due in part to some of the things we're talking about today.

NASA is one of America's most important and effective long term investment in innovation. For decades, a relatively small investment by the taxpayer in proportion to the whole budget, has led to a legion of technologies and applications that have benefited us all in everyday life, even as the non-quantifiable wonder of the space program lifted our nation's spirits and helped unite us in larger goals that cross borders.

Many of you know that a few years ago I tried to go to space. While there has been some criticism... the reasons I did it were several fold... extend ISS, commercial space development, role model for others (including Wes and Mitch) – get to go! Willing to take risks, for me the risks were many. The worst thing that ended up happening was that I had a lot of editorials/blogs write that I must have a huge ego to ask people to pay me to go to space... It turns out that was a great experience to live through.. it does in fact get easier. The excitement that even my short effort engendered (autographs, news articles, school visits etc) showed me the tremendous potential that human spaceflight offers. Millions of people want to go to space in some way and while it is not NASA's job to fly them, helping develop an industry where they can do so is part of our innovative technology and economic development mission. We're talking about a future where flying suborbital and low Earth orbit experiments is routine. Where universities can send researchers to space along with their experiments. Where spaceports across the country, led by the state of the art facility at Kennedy Space Center, will be

launching many, many more rockets than we do today. Where many companies that are startups now are major employers.

As I said in the beginning of my remarks... I've grown up with WIA. So many of you have been my mentors and friends. I've always felt we shared a common bond partly because we each individually chose a professional career in this field – whether we are scientists, engineers, teachers, lawyers, lobbyists, politicians, reporters, or bureaucrats – we're largely here because we believe that space development can provide a better future for humanity. With all of us working together – that is what awaits Katie Grace and the rest of her generation.